

IN THE CLAIMS:

Please amend/cancel/add the claims as follows:

1. (Currently Amended) A process for specific and direct manipulation of small quantities of matter on a solid-body surface surfaces,

~~in which, which comprises generating, with the aid of one or more acoustic surface waves generated by a surface-wave generator, an impulse is generated along the solid-body surface, whereby the surface wave is generated with a surface-wave generator (1, 27, 61, 95, 97, 99), and~~

~~the impulse (16, 36, 105) is made to interact which interacts with at least one quantity of matter in order to cause movement of said quantity of matter on the said surface in a desired first direction, (17, 39) said functionalization being achieved by modulation of wetting properties of parts of said solid-body surface to define at least one hydrophobic region and at least one region that is hydrophilic as compared with said hydrophobic region, or at least one lipophobic region and at least one region that is lipophilic as compared with said lipophobic region.~~

2. (Currently Amended) [[A]] The process according to claim 1, in which, by functionalizing parts ~~(15, 49, 83, 85, 87)~~

Serial No.: 09/766,677
Atty. Docket No.: P66217US0

of the solid-body surface, at least one defined trajectory is set for the quantity of matter and the defined, said at least one quantity of matter will be being moved by the said impulse transfer along this said at least one trajectory.

3. (Currently Amended) [[A]] The process according to claim 2, in which the functionalization of the solid-body surface is further achieved by grooves[,] or barriers, lithographic definition of channels, or modulation of wetting properties.

4. (Currently Amended) [[A]] The process according to claim [[3]] 1, in which the functionalization is achieved by modulation of the wetting properties of the solid-body surface and the modulation of the wetting properties is achieved by lithographic definition of said at least one hydrophobic region and at least one region that is hydrophilic in comparison to it or at least one lipophobic region and at least one region that is lipophilic in comparison to it are defined lithographically.

5. (Currently Amended) [[A]] The process according to claim [[3]] 1, in which the functionalization of the solid-body surface is achieved by modulation of the wetting properties of

Serial No.: 09/766,677
Atty. Docket No.: P66217US0

~~the at least one part~~ parts of the solid-body surface ~~and the~~
~~modulation of the wetting properties~~ is achieved through
silanization of ~~this part~~ said parts of the solid-body surface.

6. (Currently Amended) [[A]] The process according to
claim 1, in which the acoustic surface waves are generated by
electric stimulation.

7. (Currently Amended) [[A]] The process according to
claim 1, in which interdigital converters ~~{1, 27, 31, 61, 95, 97,~~
~~99}~~ are used to generate the acoustic surface waves.

8. (Currently Amended) [[A]] The process according to
claim 6, in which the acoustic surface waves are generated by
means of the piezoelectric effect in a piezoelectric substrate or
a piezoelectric region of a substrate.

9. (Currently Amended) [[A]] The process according to
claim 8, in which a piezoelectric layer is used on the substrate
surface to generate the surface waves, said layer having that is
selected in such a way that it has different wetting properties
than the rest a remainder of the substrate surface.

10. (Currently Amended) [[A]] The process according to claim 1, in which the impulse transfer between the at least one acoustic surface wave and the at least one quantity of matter is transmitted by the electric fields accompanying the wave in a the piezoelectric substrate or at least in a the piezoelectric region of the solid-body surface.

11. (Currently Amended) [[A]] The process according to claim 1, in which the impulse transfer between the at least one acoustic wave and the at least one quantity of matter is transmitted by the mechanical deformation of the solid-body surface that accompanies the surface wave.

12. (Currently Amended) [[A]] The process according to claim 1, in which shear waves, Lamb waves, Rayleigh waves, Love waves, or combinations thereof are used as surface waves.

13. (Currently Amended) [[A]] The process according to claim 1, in which surface waves of different frequencies f_1, \dots, f_n are sent to different regions of the surface x_1, \dots, x_n .

Serial No.: 09/766,677
Atty. Docket No.: P66217US0

14. (Currently Amended) [[A]] The process according to claim 13, in which, to generate surface waves in different regions ~~(5, 21)~~ of the surface, at least two generators ~~(1, 27, 31, 61, 95, 97, 99)~~ with different operating frequencies are used for surface waves.

15. (Currently Amended) [[A]] The process according to claim [[7]]14, in which the at least two generators include interdigital converters with constant but different distances between the fingers of each.

16. (Currently Amended) [[A]] The process according to claim 7, in which, to generate surface waves of different frequencies, at least one interdigital converter ~~(61, 95, 97, 99)~~ with non-constant distances between the fingers is used.

17. (Currently Amended) [[A]] The process according to claim 1, in which superimposition of at least two acoustic surface waves is used to establish a the size and direction of a the velocity vector of the at least one quantity of matter.

18. (Currently Amended) [[A]] The process according to claim 1, in which the at least one quantity of matter is divided by at least one acoustic surface wave into at least two smaller subquantities.

19. (Currently Amended) [[A]] The process according to claim 1, in which the at least one quantity of matter is analyzed within at least one region of the solid-body surface in regard to at least one physical, chemical, or biological characteristic.

20. (Currently Amended) [[A]] The process according to claim 19, in which a part of the at least one quantity of matter is separated from the rest of the quantity of matter, either before or after the analysis.

21. (Currently Amended) [[A]] The process according to claim 19, in which the at least one quantity of matter is analyzed with at least one acoustic surface wave in regard to a its size, its mass, and its optical, magnetic, electric, and/or dielectric properties of said at least one quantity of matter.

~~{* German "einem" should be "einem der"}~~

Serial No.: 09/766,677
Atty. Docket No.: P66217US0

22. (Currently Amended) [[A]] The process according to claim 1, in which at least one part of the at least one quantity of matter is modified in at least one region on the solid-body surface by chemical, physical, or biological processes.

23. (Currently Amended) [[A]] The process according to claim 22, in which the at least one part of the at least one quantity of matter is modified by functionalizing at least one region of the solid-body surface with respect to its physical, chemical, or biological properties.

24. (Currently Amended) [[A]] The process according to claim 19, in which the at least one quantity of matter to be by analyzed ~~or modified~~ is immobilized reversibly and temporarily on at least one region of the solid-body surface by modulation or coating of said at least one ~~this~~ region of the solid-body surface through chemisorption or physisorption.

25. (Currently Amended) [[A]] The process according to claim 1, in which ~~the~~ at least two quantities of material are brought into contact in at least one region ~~(25)~~ of the solid-body surface by specific and direct movement ~~(17, 20)~~ for

Serial No.: 09/766,677
Atty. Docket No.: P66217US0

purposes of being mixed and/or at least one physical, chemical, or biological reaction.

26. (Currently Amended) [[A]] The process according to claim 25, in which the at least two quantities of matter are moved toward each other with the aid of two surface waves running in opposite directions.

27. (Currently Amended) [[A]] The process according to claim 1, in which surface waves are sent from various directions to the at least one quantity of matter, in order to achieve a mixing of the at least one quantity of matter.

28. (Currently Amended) [[A]] The process according to claim 1, in which the at least one surface wave is generated by wireless irradiation of at least one electromagnetic wave into at least one generator ~~(1, 27, 31, 61, 95, 97, 99)~~ for surface waves.

29. (Currently Amended) [[A]] The process according to claim 1, in which at least one additional surface wave is irradiated from a second direction ~~(37)~~ onto the at least one

Serial No.: 09/766,677
Atty. Docket No.: P66217US0

quantity of matter that does not correspond to the ~~original~~ first direction of movement ~~(17)~~ of the quantity of matter.

30. (Currently Amended) [[A]] The process according to claim 1, in which at least one surface wave is sent approximately tangentially onto at least one quantity of matter, in order to place it said quantity of matter in rotation.

Claims 31-70 (Canceled).

71. (New) A process for specific and direct manipulation of small quantities of matter on a solid-body surface which comprises generating, with the aid of one or more acoustic surface waves generated by a surface-wave generator, an impulse along the solid-body surface which interacts with at least one quantity of matter in order to cause movement of said quantity of matter on said surface along at least one defined trajectory, said trajectory defined by the functionalization of parts of the solid-body surface through modulation of wetting properties of said solid-body surface to define at least one hydrophobic region and at least one region that is hydrophilic as compared with said hydrophobic region, or at least one lipophobic region and at

Serial No.: 09/766,677
Atty. Docket No.: P66217US0

least one region that is lipophilic as compared with said lipophobic region.

72. (New) A process for specific and direct manipulation of small quantities of matter on a solid-body surface which comprises generating, with the aid of one or more acoustic surface waves generated by a surface-wave generator, an impulse along the solid-body surface which interacts with at least one quantity of matter in order to cause movement of said quantity of matter along at least one defined trajectory, said trajectory defined by the functionalization of at least one part of the solid-body surface, said functionalization being achieved by modulation of wetting properties of at least one part of said solid-body surface through silanization of said part of the solid-body surface so that said wetting properties of said part are different from surrounding solid-body surface regions.

73. (New) A process for specific and direct manipulation of small quantities of matter on a solid-body surface comprising the steps of:

generating, one or more acoustic surface waves by electric stimulation to produce an impulse along the solid-body

Serial No.: 09/766,677
Atty. Docket No.: P66217US0

surface, said surface wave being generated by means of the piezoelectric effect in a piezoelectric region of said solid-body surface, said piezoelectric region having different wetting properties than the rest of the solid-body surface; and

making the impulse interact with at least one quantity of matter in order to cause movement on the surface in a desired direction.

74. (New) The process according to claim 73, in which, by functionalizing parts of the solid-body surface, at least one defined trajectory is set for the quantity of matter and the at least one quantity of matter is moved by the impulse transfer along said at least one trajectory.

75. (New) A process for specific and direct manipulation of small quantities of matter on a solid-body surface comprising the steps of:

generating, with the aid of one or more acoustic surface waves, an impulse along the solid-body surface, said surface waves being generated by interdigital converters, with at least one of said converters having non-constant distances

Serial No.: 09/766,677
Atty. Docket No.: P66217US0

between fingers thereof to generate surface waves of different frequencies; and

making the impulse interact with at least one quantity of matter in order to cause movement on the surface in a desired direction.

76. (New) The process according to claim 75, in which, by functionalizing parts of the solid-body surface, at least one defined trajectory is set for the quantity of matter and the at least one quantity of matter is moved by the impulse transfer along this at least one trajectory.

77. (New) The process according to claim 76, in which the functionalization of the solid-body surface is achieved by grooves, barriers, lithographic definition of channels, or modulation of wetting properties.

78. (New) A process according to claim 77, in which the functionalization is achieved by modulation of the wetting properties of the solid-body surface by definition of at least one hydrophobic region and at least one region that is hydrophilic in comparison to said hydrophobic region or at least

Serial No.: 09/766,677
Atty. Docket No.: P66217US0

one lipophobic region and at least one region that is lipophilic in comparison to said lipophobic region.

79. (New) The process according to claim 78, in which said at least one hydrophobic region and at least one region that is hydrophilic in comparison to it or at least one lipophobic region and at least one region that is lipophilic in comparison to it are defined lithographically.

80. (New) The process according to claim 75, in which the acoustic surface waves are generated by means of the piezoelectric effect in a piezoelectric substrate or a piezoelectric region of a substrate.

81. (New) The process according to claim 75, in which the impulse transfer between the at least one acoustic surface wave and the at least one quantity of matter is transmitted by the electric fields accompanying the wave in a piezoelectric substrate or at least in a piezoelectric region of the solid-body surface.

82. (New) The process according to claim 75, in which the impulse transfer between the at least one acoustic wave and the at least one quantity of matter is transmitted by the mechanical deformation of the solid-body surface that accompanies the surface wave.

83. (New) The process according to claim 75, in which shear waves, Lamb waves, Rayleigh waves, Love waves, or combinations thereof are used as surface waves.

84. (New) The process according to claim 75, in which surface waves of different frequencies are sent to different regions of the surface.

85. (New) The process according to claim 84, in which, to generate surface waves in different regions of the surface, at least two generators with different operating frequencies are used for surface waves.

86. (New) The process according to claim 85, in which the at least two generators include interdigital converters with constant but different distances between the fingers of each.

Serial No.: 09/766,677
Atty. Docket No.: P66217US0

87. (New) The process according to claim 75, in which superimposition of at least two acoustic surface waves is used to establish a size and direction of a velocity vector of the at least one quantity of matter.

88. (New) The process according to claim 75, in which the at least one quantity of matter is divided by at least one acoustic surface wave into at least two smaller subquantities.

89. (New) The process according to claim 75, in which the at least one quantity of matter is analyzed within at least one region of the solid-body surface in regard to at least one physical, chemical, or biological characteristic.

90. (New) The process according to claim 89, in which a part of the at least one quantity of matter is separated from the rest of the quantity of matter, either before or after the analysis.

91. (New) The process according to claim 89, in which the at least one quantity of matter is analyzed with at least one acoustic surface wave in regard to a size, mass, and optical,

Serial No.: 09/766,677
Atty. Docket No.: P66217US0

magnetic, electric, and/or dielectric properties of said at least one quantity of matter.

92. (New) The process according to claim 75, in which at least one part of the at least one quantity of matter is modified in at least one region on the solid-body surface by chemical, physical, or biological processes.

93. (New) The process according to claim 92, in which the at least one part of the at least one quantity of matter is modified by functionalizing at least one region of the solid-body surface with respect to its physical, chemical, or biological properties.

94. (New) The process according to claim 89, in which the at least one quantity of matter to be analyzed is immobilized reversibly and temporarily on at least one region of the solid-body surface by modulation or coating of said at least one region of the solid-body surface through chemisorption or physisorption.

Serial No.: 09/766,677
Atty. Docket No.: P66217US0

95. (New) The process according to claim 75, in which at least two quantities of material are brought into contact in at least one region of the solid-body surface by specific and direct movement for purposes of being mixed and/or at least one physical, chemical, or biological reaction.

96. (New) The process according to claim 95, in which the at least two quantities of matter are moved toward each other with the aid of two surface waves running in opposite directions.

97. (New) The process according to claim 75, in which surface waves are sent from various directions to the at least one quantity of matter, in order to achieve a mixing of the at least one quantity of matter.

98. (New) The process according to claim 75, in which the at least one surface wave is generated by wireless irradiation of at least one electromagnetic wave into at least one generator for surface waves.

99. (New) The process according to claim 75, in which at least one additional surface wave is irradiated from a direction

Serial No.: 09/766,677
Atty. Docket No.: P66217US0

onto the at least one quantity of matter that does not correspond to the original direction of movement of the quantity of matter.

100. (New) The process according to claim 75, in which at least one surface wave is sent approximately tangentially onto at least one quantity of matter, in order to place said quantity of matter in rotation.